



PUMA 600 / 700 / 800 XL / LY / XLY

Heavy Duty Turning Center



Doosan Machine Tools

Optimal Solutions for the Future

Heavy Duty Turning Center

PUMA 600 XL/LY/XLY

PUMA 700 XL/LY/XLY

PUMA 800 XL/LY/XLY



Just single setup is enough for large and complex parts

The Puma 600 / 700 / 800 XL / LY / XLY has a 5 meter workpiece length and Y axis capability, giving Doosan a unique place in the market.

First, one setup completes extra long and large workpieces which require both turning and heavy duty milling.

Second, extra rigid construction provides heavy duty machining.

Third, high precision milling applications are possible using improved C axis performance and orthogonal Y axis capability.

One Set-Up Performance

- The largest work envelope in its class.

Rigid Structure

- 20% Increased bed guideway span compared with current model.
- Integral hand-scraped box guideway construction on all slides.

High Precision

- Addition of high resolution rotary scale for high precision C-axis control.
- X-Y interpolation - Easy and fast milling operation.



High Efficiency

PUMA 600 / 700 / 800 XL / LY / XLY are designed to maximise your productivity and increase profit.

PUMA 600 / 700 / 800 XL / LY / XLY

| Model | Investment | Design | Manpower | Operation | Tools |
|-------------------------------|---|--|---|---|---|
| Turning Center 1 machine |  |  |  |  |  |
| Machining Center 1 machine |  |  |  |  |  |
| PUMA 700 XLY 1 machine |  |  |  |  |  |



Large Size Workpiece

One setup can complete extra long and large complex parts requiring a variety of turning and milling operations.

Unit : mm (inch)

| Model | A* Bar working | B Max. work length | Max. turning dia. | Y-axis |
|------------------|-----------------------|--------------------------|----------------------|------------------|
| PUMA 600XL / XLM | ø 117 (4.6) | 5050 (198.8) | 900 (35.4) | 200 (±100) |
| PUMA 600XLY | | | 750 (29.5) | (7.9 (±3.9)) |
| PUMA 700XL / XLM | ø 164 (6.5) | 5050 (198.8) | 900 (35.4) | 200 (±100) |
| PUMA 700XLY | | | 750 (29.5) | (7.9 (±3.9)) |
| PUMA 800XL / XLM | ø 318** (12.5**) | 5050 (198.8) | 900 (35.4) | 200 (±100) |
| PUMA 800XLY | | | 750 (29.5) | (7.9 (±3.9)) |

* : Workpiece diameter through drawtube.

** : Maximum bar working in view of spindle bore without draw tube.



• PUMA 700XLY

Unit : mm (inch)

| Model | A* Bar working | B Max. work length | Max. turning dia. | Y-axis |
|----------------|-----------------------|--------------------------|----------------------|------------------|
| PUMA 600L / LM | ø 117 (4.6) | 3200 (126.0) | 900 (35.4) | 200 (±100) |
| PUMA 600LY | | 3250 (128.0) | 750 (29.5) | (7.9 (±3.9)) |
| PUMA 700L / LM | ø 164 (6.5) | 3200 (126.0) | 900 (35.4) | 200 (±100) |
| PUMA 700LY | | 3250 (128.0) | 750 (29.5) | (7.9 (±3.9)) |
| PUMA 800L / LM | ø 318** (12.5**) | 3200 (126.0) | 900 (35.4) | 200 (±100) |
| PUMA 800LY | | 3250 (128.0) | 750 (29.5) | (7.9 (±3.9)) |

* : Workpiece diameter through drawtube.

** : Maximum bar working in view of spindle bore without draw tube.



• PUMA 700LM

High Efficiency

Doosan Infracore precision machine tools are internationally known for their durability, rigidity and high accuracy. Only well proven and time tested manufacturing techniques can produce machines of this quality.

PUMA 600 / 700 / 800 XL / LY / XLY

The PUMA 600 / 700 / 800 XL / LY / XLY is a true 45 degree slant bed design. The bed is a one piece casting with both the saddle and tailstock guideways in the same plane to eliminate thermal distortion. The heavily ribbed torque tube design prevents twisting and deformation. Fine grain Meehanite processed cast iron is used because of its excellent damping characteristics. This ensures high rigidity with no deformation during heavy cutting. The slant angle allows for easy loading, changing and inspection of tools. All guideways are wide wrap-around rectangular type for un-surpassed long-term rigidity and accuracy. The guideways are widely spaced to ensure stability and fully protected. Each guide-way is induction hardened and precision ground. A fluoroplastic resin, Rulon® 142, is bonded to the mating way surfaces, for its wear and friction characteristics and then hand scraped for a perfect fit and center height. Optional long bed enables extra-long shaft machining. Guide way span and rib combination was redesigned to get better static and dynamic stiffness. Guide way span is 20 % larger than the current machine.



Rapid Traverse

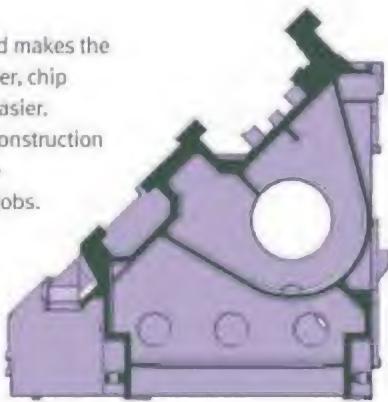
Scraping of Slideway



Outstanding rigidity for high feedrates



Slant-design bed makes the work go smoother, chip removal much easier. Tough tubular construction stands up to the hardest cutting jobs.



Main Spindle

PUMA 600 / 700 / 800 XL / LY / XLY

Main Spindle Drive

The 45kW (60.3Hp) spindle motor provides power for heavy stock removal, greatly reducing the number of roughing passes required. The reliable digital AC spindle motor provides fast acceleration and is maintenance free. The preloaded spindle bearings are specifically calibrated to maintain the perfect balance of rigidity and speed. The geared headstock ensures optimal power throughout a wide speed range.



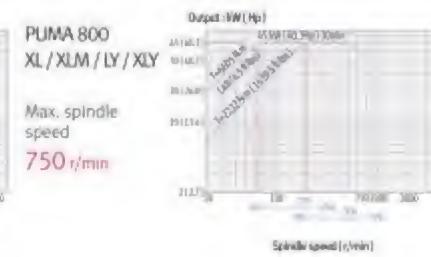
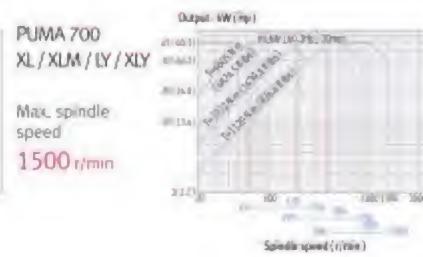
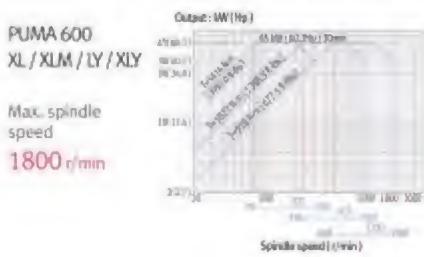
Max. spindle speed
1800 r/min
[PUMA 600 XL / XLM / LY / XLY]

1500 r/min
[PUMA 700 XL / XLM / LY / XLY]

750 r/min
[PUMA 800 XL / XLM / LY / XLY]

Motor (30 min)
45 kW (60.3 Hp)

Main spindle power-torque diagram



Headstock and Spindle Construction

The headstock casting is made of Meehanite and ribbed on the outside to increase the surface area for better heat dissipation. The headstock and main spindle are manufactured in a temperature controlled environment then assembled and tested in our clean room. The heavy duty cartridge type spindle is supported by a double row of cylindrical roller bearings in the front and rear, with duplex angular thrust bearings in between. The cylindrical roller bearings feature a large contact surface which ensures the highest rigidity for heavy loads and superior surface finishes. All spindle bearings are permanently grease lubricated precision class P4.



Geared Head

Power is delivered to the spindle through a three (PUMA 600 / 700 XL / XLM / LY / XLY) or two (PUMA 800 XL / XLM / LY / XLY) speed geared head allowing stable spindle speeds change as well as powerful torque.



Turret

PUMA 600 / 700 / 800 XL / LY / XLY

Heavy Duty Turret

The large 12 station heavy duty turret features a large Curvic coupling diameter. This heavy duty design provides unsurpassed rigidity for heavy stock removal, fine surface finishes.

Index time (1-station swivel) No. of tool station
0.25 s **12 ea**



• PUMA 600 / 700 / 800 XLM



• PUMA 600 / 700 / 800 LY / XLY

PUMA 600 / 700 / 800 XL series PUMA 600 / 700 / 800 XLM / LY / XLY series

Tool Holder **DI holder base** Tool Holder **BMT 85P** Max. Speed **3000 r/min** Motor **11 / 7.5 r/min**
(14.8 / 10.1 Hp)

Preci-Flex Ready Rotary Tools

Preci-Flex ready rotary tool holders are available on the milling versions. Preci-Flex is a tooling system utilizes the existing ER collet taper in the rotary holders. The spindle face is precision ground relative to the taper and there are four drilled and tapped holes in this face. The Preci-Flex adapters locate on both the taper and the spindle face for maximum rigidity.



Collet application

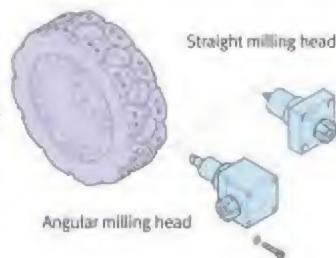


Preci-Flex adapter application

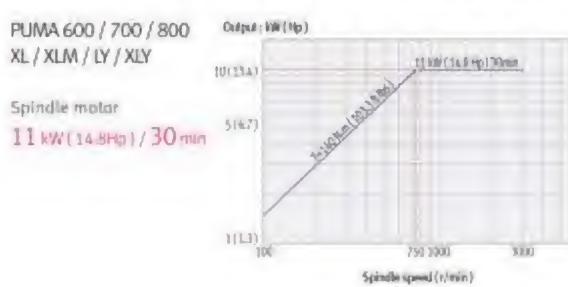
Radial BMT Turret

The turret for rotary tool head features BMT style tooling in which the tool holders are mounted directly to the turret's periphery using 4 large bolts.

This type of mounting system allows an extremely high degree of rigidity



Rotary tool spindle power-torque diagram





• PUMA 600 / 700 / 800 XL

Y-Axis Capability

To get Y-axis movement, additional column way is used to move rotary tool across the face of the spindle.

The Y-axis way is placed under the carriage / cross slide, on which the turret is mounted. In the Y-axis plane, tools can move in a plus or minus direction perpendicular to the Z-axis and spindle center line. Viewed from the operator's perspective, this Y-axis motion is toward or away from the door of the machine while X-axis motion is floor to ceiling.

X-axis

400 mm (15.7 inch)

Y-axis

200 (± 100) mm (7.9 inch)



Programmable Tailstock

In order to increase its rigidity, Tail stock was engineered more simply than current model. Quill travel is 200 mm (7.9 inch).



| | Unit | Previous | PUMA 700XLY |
|------------------|-----------|-----------|-------------|
| Quill Thrust | kN | 32 | 42 |
| Quill diameter | mm (inch) | 160 (6.3) | 160 (6.3) |
| Quill bore taper | | MT#6 | MT#6 |
| Quill travel | mm (inch) | 160 (6.3) | 200 (7.9) |

Axis Drive Construction

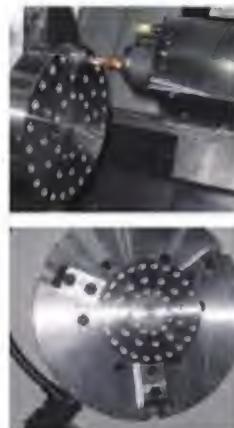


Axis Drives

Each axis is powered by a maintenance free digital AC servo motor. These high torque drive motors are connected to the ball screws without intermediate gears for quiet and responsive slide movement with virtually no backlash.

Accuracy

C-axis index Precision



| C-axis index | | |
|---|------------------|---------------|
| Rotary Scale | Positioning | Repeatability |
| PUMA 700XLY | 9" | 5" |
| PUMA 700XLM | 8" | 4" |
| Cutting Hole PCD Ø 350 mm (13.8 inch) | | |
| Position 0.036 mm (0.00141 inch) | | |
| Cutting Condition | | |
| Speed | 1200 r/min | |
| Feed | 25 mm/min | |
| Depth | 0.5 mm | |
| Tool | Ø 16 mm End mill | |
| * Carbon steel (SM45C) | | |

X-Y simultaneous Precision



| Roundness | 0.029 mm (0.0011 inch) |
|------------------------|----------------------------------|
| Squareness | 0.010 mm (0.0004 inch) |
| Straightness | 0.004 mm (0.0002 inch) |
| Parallelism | 0.010 mm (0.0004 inch) |
| Cutting Condition | |
| Speed | 1600 r/min |
| Feed | 200 mm/min |
| Depth | 0.5 mm |
| Tool | Ø 10 mm End mill |
| * Carbon steel (SM45C) | |

C-X Polar Interpolation (Eccentric circle)



| | |
|------------------------|------------------------------|
| Roundness (Ø 200 mm) | 0.025 mm (0.001 inch) |
| Cutting Condition | |
| Speed | 1600 r/min |
| Feed | 260 mm/min |
| Depth | 0.5 mm |
| Tool | Ø 10 mm End mill |
| * Carbon steel (SM45C) | |

Y-Z simultaneous Precision



| | |
|--------------|----------------------------------|
| Roundness | 0.030 mm (0.0012 inch) |
| Squareness | 0.015 mm (0.0006 inch) |
| Straightness | 0.005 mm (0.0002 inch) |
| Parallelism | 0.010 mm (0.0004 inch) |

Thread Milling Function



Cutting sample

Cutting method

M55 x P2.0 Thread
C-X Polar Coordinate
X-Y / Y-Z
Helical Interpolation



Test results
Thread Gage Check

| Cutting Condition | |
|------------------------|---------------------|
| Speed | 1500 r/min |
| Feed | 260 mm/min |
| Depth | 30 mm |
| Tool | Ø 20 mm Mill Thread |
| * Carbon steel (SM45C) | |

High Performance

More powerful revolving motor is adapted to improve the productivity.



End mill (Low Speed)

| | |
|-------------------|--------------------------|
| Material | SM45C |
| Cutting Tool | Ø 32 (HSS) |
| Cutting Condition | Speed m/min 30 |
| | Feed mm/min 90 |
| Chip Removal rate | cm ³ /min 105 |



End mill (High Speed)

| | |
|-------------------|--------------------------|
| Material | SM45C |
| Cutting Tool | Ø 25 (Carbide) |
| Cutting Condition | Speed m/min 220 |
| | Feed mm/min 1000 |
| Chip Removal rate | cm ³ /min 175 |



Tapping

| | |
|-------------------|-----------------|
| Material | SM45C |
| Cutting Tool | M33 x P3.5 |
| Cutting Condition | Speed m/min 15 |
| | Feed mm/rev 3.5 |
| Spindle Load | 125 % |



O.D turning

| | |
|-------------------|---------------------------|
| Material | SM45C |
| Cutting Condition | Speed m/min 230 |
| | Feed mm/rev 0.6 |
| | Dia mm Ø 380 |
| | Depth mm 10 |
| Chip Removal rate | cm ³ /min 1418 |



Helical End Milling

| | |
|-------------------|--------------------------|
| Material | SM45C |
| Cutting Tool | Ø 25 (Carbide) |
| Cutting Condition | Speed m/min 240 |
| | Feed mm/min 800 |
| Chip Removal rate | cm ³ /min 100 |



U-Drill (Rotary Drilling)

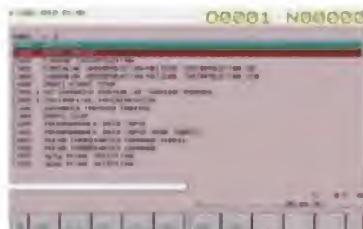
| | |
|-------------------|--------------------------|
| Material | SM45C |
| Cutting Tool | Ø 30 U-Drill |
| Cutting Condition | Speed r/min 2000 |
| | Feed mm/rev 0.12 |
| Chip Removal rate | cm ³ /min 171 |

- The results indicated in this catalogue are provided as example. They may not be obtained due to differences in cutting conditions and environmental conditions during measurement.
- Turing results are obtained in the condition of standard motor.

Easy Operation Package

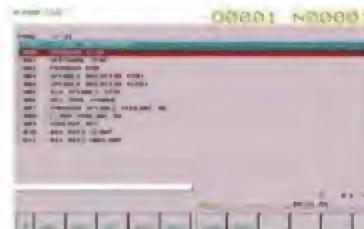
More powerful revolving motor is adapted to improve the productivity.

Programming



G Code List

Operator can check the meaning of each G-code.



M Code List

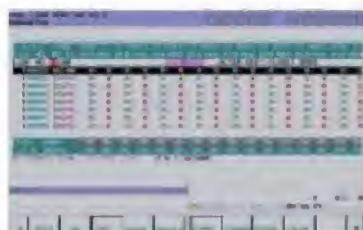
Operator can check the meaning of each M-code.



Calculator

Operator can calculate numerical formula in relation to arc and hole easily.

Operation / Maintenance



Tool Load Monitor opt.

The main function of this software is to detect overload when a tool is wrong, and change it to an other tool. Stop machine to protect a tool holder and next tools by

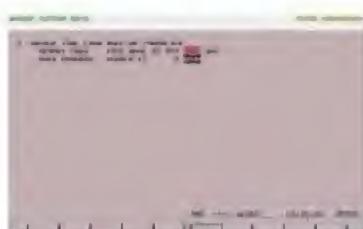
detecting overload caused by tool breakage or its wear. Use editable tool life management for spare tools. Monitor load meter for all spindles and axes. If the tool load reaches abnormal band recorded in "Set data", the software issues an feed hold alarm or skips the tool.



Operation Rate - User Log In

A major determinant of efficiency is the cost associated with setting up the equipment to make a particular product. This software can be used to manage

machine operation rate of 3 operators. Total machine operation and real machining time for a month can be recorded and measured. It helps to evaluate and monitor each operational efficiency. To keep it secure, Password setting is essential.



Back Up Custom Data

This can be used to record tool load information detected in "Tool load monitor" for all tools used during cutting. By reloading recorded data in tool

table, Tool Load Monitor software can compare the actual tool load with a recorded load pattern.

Easy Guide i

Operation Guidance, which supports entire operations on an all-in-one screen for daily machining including creating a program on the machine.

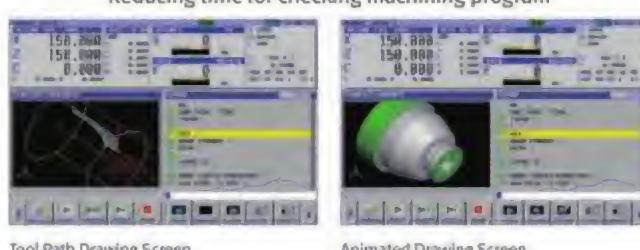
- Uses one display screen to perform all operations Including programming, checking by animation, and real machining.
- User-Friendly Operation : Soft key selection of comprehensive cycle library
- Easy programming Based on ISO-code program format, complex machining motions can be created easily by this menu format.

- Machine status window Machine status such as actual position, feedrate and load meter are always displayed.
- Realistic machining simulation 3-D solid model machining simulation is available.
- Intuitive menu selecting Menu can be selected easily and intuitively by soft-keys with icons.



Realistic machining simulation

- Realistic drawing of both turning and milling with 3-D solid models are available.
- Milling on a slanted surface can be simulated.
- Cutter mark according to a tool tip shape can be expressed.
- Tool path drawing is available



Reducing time for checking machining program

Tool Path Drawing Screen

Animated Drawing Screen

Cycle for lathe machining

- Drilling
- Bar roughing (including preformed work-piece)
- Bar finishing
- Threading (General purpose thread, metric, etc.)
- Grooving (Standard, Trapezoidal)

Cycle machining menus for both of lathe machining and milling are available

Programming time can be reduced



Example of Lathe Machining Cycle

Tool data management function

The tool database is constructed by adding Manual Guide i data to conventional CNC tool data.

- Tool Offset Data (Standard CNC tool data)
- Tool Type (General, Threading, Grooving, Drilling, Tapping, End Mill, etc.)
- Tool Setting (OD, ID, Right, Left, etc.)
- Tool Shape Data (Tool Nose Radius, Cutting Angle, Grooving width, Grooving length, Threading Angle, etc.)
- Automatically referenced for animation
- Automatically referenced when Cycle Command is executed



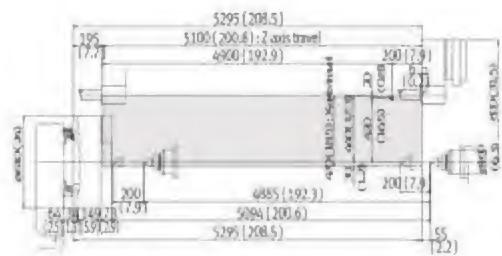
Example of Tool Data Screen

Working Range

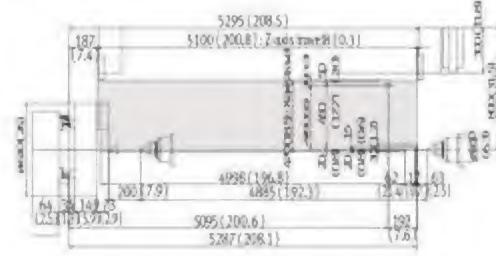
PUMA 600 / 700 / 800 XL

Unit : mm (inch)

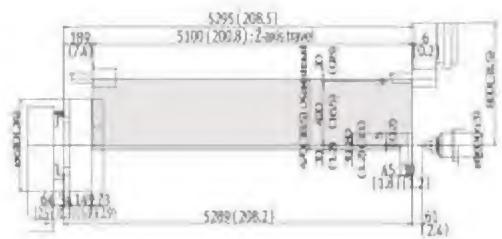
Stroke Diagram



OD Tool Holder

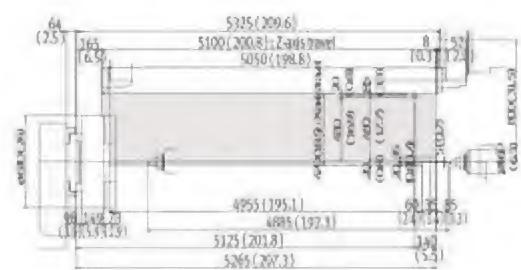


ID Tool holder

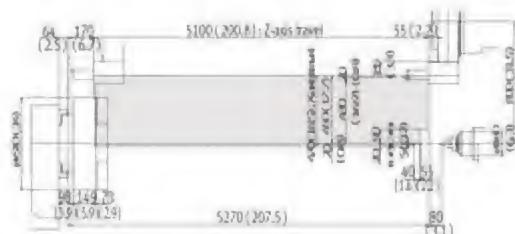


PUMA 600 / 700 / 800 XLM

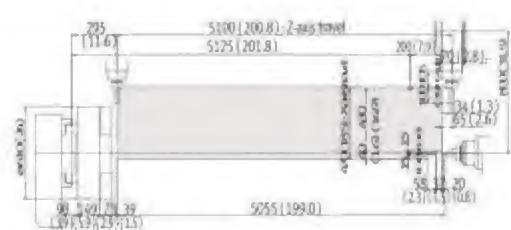
OD Tool Holder



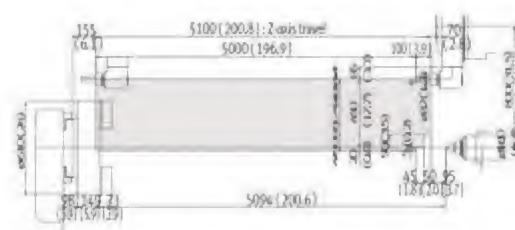
ID Tool holder



Straight milling unit



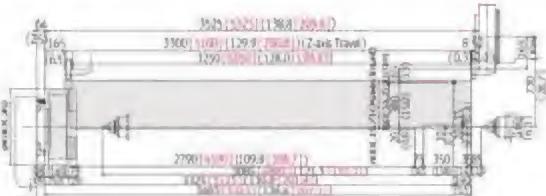
Angular milling unit



PUMA 600 / 700 / 800 LY [XLY]

Unit: mm (inch)

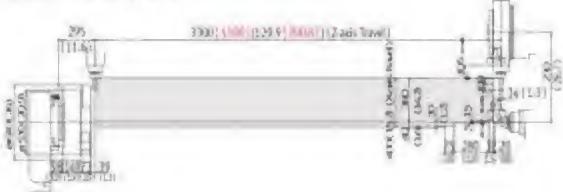
OD Tool Holder



ID Tool holder



Straight milling unit

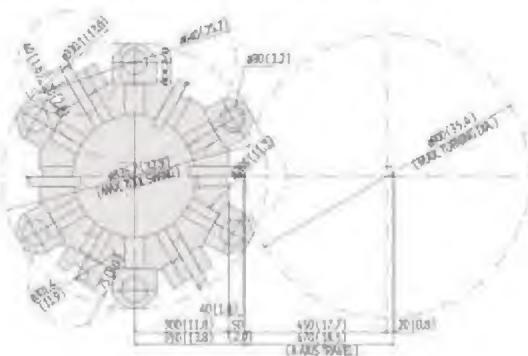


Angular milling unit

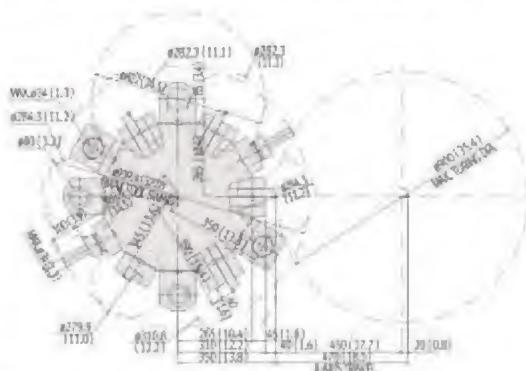


Tool Interference Diagram

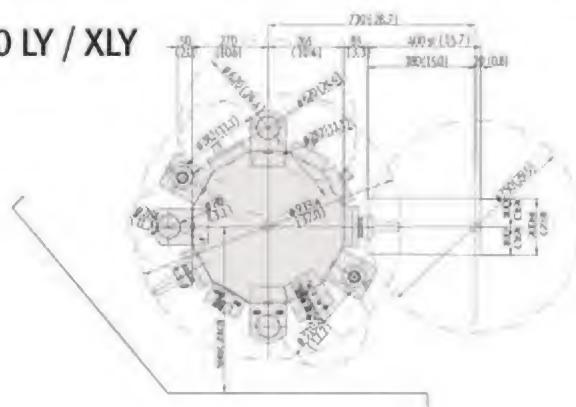
PUMA 600 / 700 / 800 XL



PUMA 600 / 700 / 800 XLM

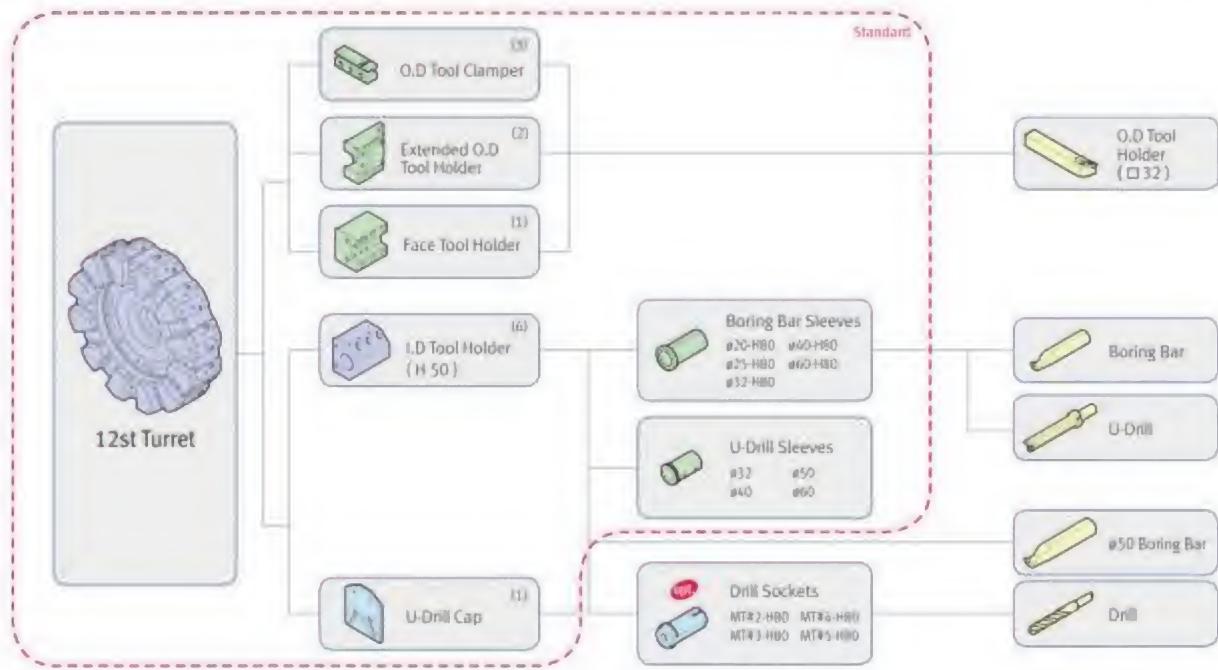


PUMA 600 / 700 / 800 LY / XLY

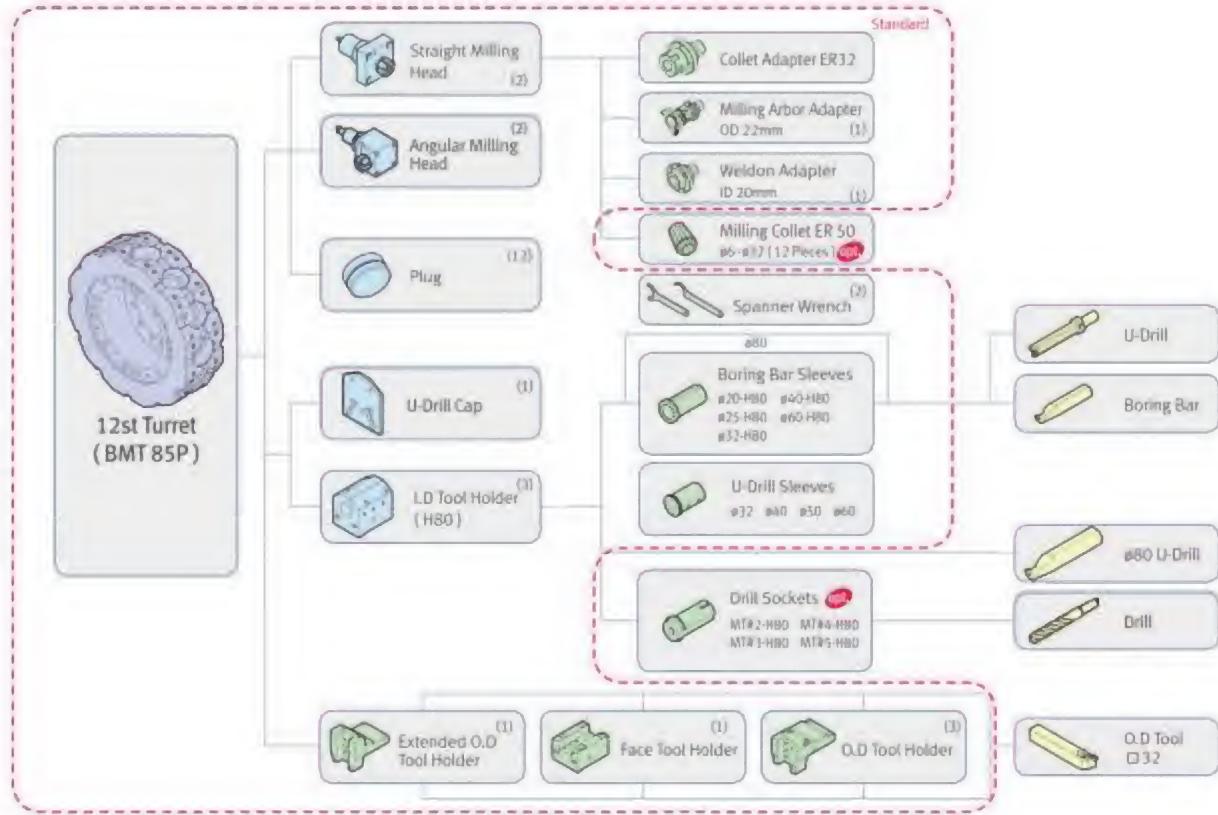


Tooling System

PUMA 600 / 700 / 800 XL



PUMA 600 / 700 / 800 XLM / LY / XLY

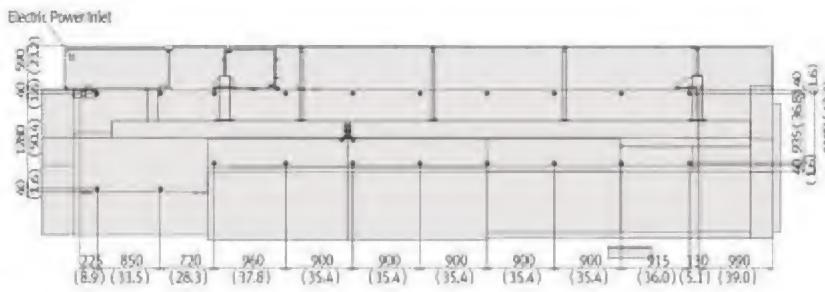


External Dimensions

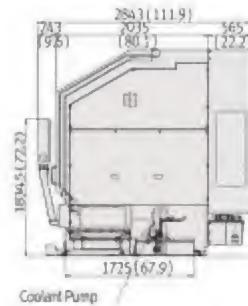
PUMA 600 / 700 / 800 XL series

Unit: mm (inch)

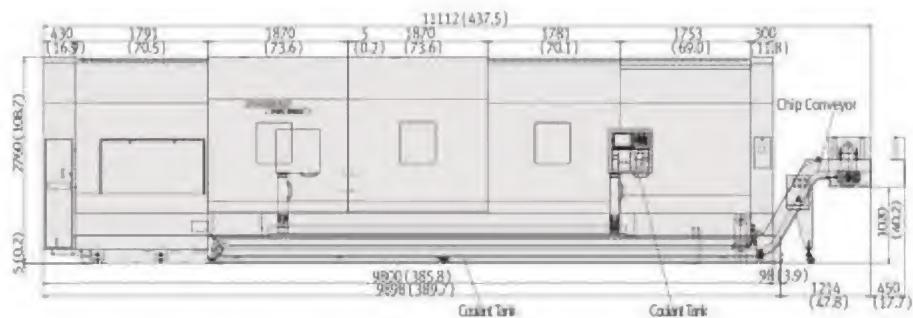
Top View



Side View

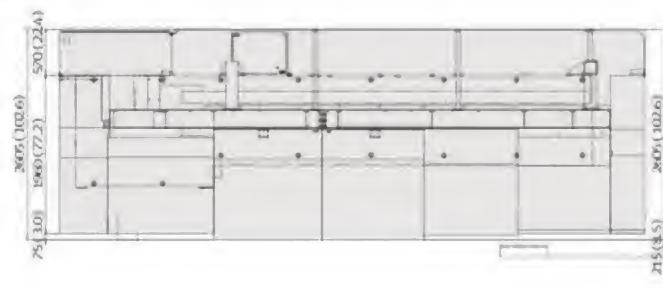


Front View

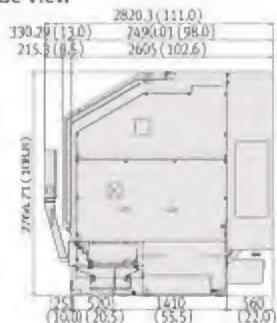


PUMA 600 / 700 / 800 LY series

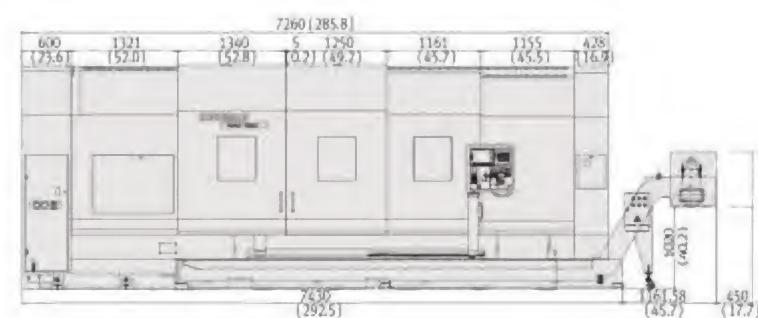
Top View



Side View



Front View



Machine Specifications

| | Description | Unit | P600L | P700L | P600L | P600LM | P700LM | P800LM | P600LY [XLY] | P700LY [XLY] | P800LY [XLY] |
|--------------|--------------------------------------|--------------|--------------|------------|-----------------|--------------|------------|-----------------------------|-------------------------------|--------------|--------------|
| Capacity | Swing over bed | mm (inch) | | | | | | 1180 (46.9) | | | |
| | Swing over saddle | mm (inch) | | | | | | 1000 (39.4) | | | |
| | Max. turning diameter | mm (inch) | | | | 900 (35.4) | | | | 750 (29.5) | |
| | Max. work length | mm (inch) | | | | 5050 (198.8) | | | 3200 (5050) (128.0) (198.8) | | |
| Cantilever | Bar working diameter | mm (inch) | 117 (4.6) | 164 (6.5) | | 137 (5.3) | 166 (6.5) | | 117 (4.6) | 164 (6.5) | |
| | Spindle bore | mm (inch) | 152 | 181 | 320 | 152 | 181 | 320 | 152 | 181 | 320 |
| | Travel distance | X-axis | mm (inch) | | 470 (18.5) | | | | | 400 (15.7) | |
| | | Z-axis | mm (inch) | | 5100 (200.8) | | | 3300 (5100) (129.9) (200.8) | 3250 (5100) (128.0) (200.8) | | |
| Feedrate | | Y-axis | mm (inch) | | | | | | | 200 (7.9) | |
| | Rapid traverse | X-axis | mm/min (ipm) | | | | | 12 (472.4) | | | |
| | | Z-axis | mm/min (ipm) | | | | | 10 (393.7) | | | |
| | | Y-axis | mm/min (ipm) | | | | | | | 6 (236.2) | |
| Main Spindle | Max. cutting frequency X, Z / Y axis | mm/rev (ipr) | | | | | | 500 (19.7) | | | |
| | Main spindle power (cont. / 30min) | kW (hp) | | | | | | 37 / 45 (49.6 / 60.3) | | | |
| | Chuck size | mm (inch) | 450 (17.7) | 510 (20.9) | | 450 (17.7) | 530 (20.9) | | 450 (17.7) | 530 (20.9) | |
| | Spindle speed | r/min | 1800 | 1500 | 750 | 1800 | 1500 | 750 | 1800 | 1500 | 750 |
| Tool post | Spindle nose | ASA | A1#15 | A1#15 | A1#20 | A2#15 | A1#15 | A1#20 | A3#15 | A1#15 | A1#20 |
| | Spindle bearing diameter (front) | mm (inch) | 200 (7.9) | 240 (9.4) | 400 (15.7) | 200 (7.9) | 240 (9.4) | 400 | 200 (7.9) | 240 (9.4) | 400 (15.7) |
| | Cs-spindle index angle | deg | | | | | | 360 (0.001) | | | |
| | Turn type | | | | DI Holder base | | | | BMTBSP | | |
| Tail Stock | No. of tool stations | ea | | | | | | 12 | | | |
| | OLD tool size | mm (inch) | | | | | | 32 x 32 (1.2 x 1.2) | | | |
| | Boring bar diameter | mm (inch) | | | | | | ø80 (3.1) | | | |
| | Indexing time (1st swivel) | s | | | | | | 0.25 | | | |
| Motors | Rotary tool speed | | | | | | | 1000 | | | |
| | Rotary tool collets | | | | | | | | ER 50 | | |
| | Quill diameter | mm (inch) | | | | | | 160 (6.3) | | | |
| | Quill bore taper | MT | | | | | | MT6 (Live) | | | |
| Power Source | Quill travel | mm (inch) | | | | | | 200 (7.9) | | | |
| | Main spindle power (cont. / 30min) | kW (hp) | | | | | | 37 / 45 (49.6 / 60.3) | | | |
| | Servo motor X-axis | kW (hp) | | | | | | 7 (9.4) | | | |
| | Z-axis | kW (hp) | | | | | | 9 (12.1) | | | |
| Machine Size | Y-axis | kW (hp) | | | | | | | 11 (14.8) | | |
| | Rotary tool spindle motor | kW (hp) | | | | | | | | | |
| | Electric power supply | kVA | | 64.44 | | | | 68.6 | | 78 | |
| | Height | mm (inch) | | | | | | 2770 (109.1) | | | |
| NC System | Length | mm (inch) | | | 9560 (388.2) | | | | 7410 (9860) (292.1) (388.2) | | |
| | Width | mm (inch) | | | | | | 3020 (118.9) | | | |
| | Weight | kg (lb) | | | 26000 (57319.3) | | | | 23000 (36000) (905.5) 57319.3 | | |
| Chuck | | | | | | | | Fanuc 30-A | | Option | |

- Design and specifications are subject to change without notice.
- Doosan is not responsible for difference between the information in the catalogue and the actual machine.

Standard Feature

- Coolant supply equipment
- Full enclosure chip and coolant shield
- Hydraulic power unit
- Leveling jack screw & plates
- Live center
- Lubrication equipment
- Work light

Optional Feature

- Air blast for chuck jaw cleaning
- Air gun
- Automatic power off
- Automatic measuring system (in process touch probe)
- Bar feeder interface
- Chip conveyor
- Chip bucket
- Dead center (MT #6)
- Dual chucking pressure
- Hardened & ground jaws
- Hydraulic chuck (PUMA 600 / 700)
- Hydraulic chuck & Cylinder (PUMA 800 / B)
- Hydraulic steady rest
- Manual steady rest
- Oil skimmer
- Pressure switch for chucking pressure check
- Proximity switches for chuck clamp detection
- Signal tower (yellow, red, green)
- Tool monitoring system
- Tool pre setter (hydraulic type)

- The specifications and information above-mentioned may be changed without prior notice.
- For more details, please contact Doosan

NC Unit Specifications

FANUC 32i

CONTROLS

| | |
|----------------------------|---|
| - Controlled path | 1 path |
| - Controlled axes | X, Z X, Z, C ¹ X, Z, C, Y ¹ |
| - Angular axis control | |
| - Cs contouring control | |
| - Backlash compensation | 0 ~ ±9999 pulses |
| - Chamfering on / off | |
| - HRV2 control | |
| - Inch / Metric conversion | |
| - Interlock | All axes / each axis |
| - Least input command | 0.001 / 0.0001 mm/inch |
| - Machine lock | All axes / each axis |
| - Mirror image | |
| - Overtravel | |
| - Position switch | |
| - Stored stroke check | 1 |

OPERATION

| | |
|------------------------------------|---------------|
| - Automatic operation (memory) | |
| - DNC Operation with Memory card | |
| - Buffer register | |
| - Dry run | |
| - Handle Incremental feed | X1, X10, X100 |
| - Program restart | |
| - Wrong operation prevention | |
| - Manual intervention and return | |
| - Manual pulse generator | 1 ea |
| - Manual reference position return | |
| - Program number search | |

INTERPOLATION FUNCTIONS

| | |
|--|-------------|
| - Nano interpolation | |
| - Positioning | G00 |
| - 1st. Reference position return | Manual, G28 |
| - 2nd. reference position return | G30 |
| - Continuous threading | |
| - Linear Interpolation | G01 |
| - Multiple threading | |
| - Reference position return check | G27 |
| - Skip | G31 |
| - Thread cutting / Synchronous cutting | |
| - Thread cutting retract | |
| - Variable lead threading | |

FEED FUNCTION

| | |
|---|---------------|
| - Automatic acceleration / deceleration | |
| - Cutting feedrate clamp | |
| - Feed per revolution | |
| - Feedrate override (10% unit) | 0 ~ 200 % |
| - Manual per revolution feed | |
| - Rapid traverse override | F0, 25, 100 % |

AUXILIARY / SPINDLE SPEED FUNCTION

| | |
|----------------------------------|----------------|
| - Constant surface speed control | |
| - High speed M / S / T Interface | |
| - Spindle orientation | |
| - M - code function | M3 digits |
| - Rigid tapping | |
| - S - code function | S4 / S5 digits |
| - Spindle serial output | S4 / S5 digits |
| - Spindle speed overide | 0 ~ 150 % |

PROGRAM INPUT

| | |
|--------------------------------------|--|
| - Absolute / incremental programming | |
|--------------------------------------|--|

| | |
|--|----------------------|
| - Addition of custom macro common variables | #100~#199, #500~#999 |
| - Automatic coordinate system setting | |
| - Canned cycle for drilling / Turning | |
| - Circular interpolation by R programming | |
| - Coordinate system setting | G50 |
| - Coordinate system shift | |
| - Custom macro | |
| - Pocket calculator type decimal point programming | |
| - Diameter / radius programming (X axis) | |
| - Direct drawing dimension programming | |
| - Direct input of coordinate system shift | |
| - G code system A / B / C | |
| - Label skip | |
| - Macro executor | |
| - Manual absolute on and off | |
| - Maximum program dimension | ±9 digit |
| - Multiple repetitive canned cycle | G70 ~ G76 |
| - Optional block skip | 9 piece |
| - Parity check | |
| - Plane selection | G17, G18, G19 |
| - Program file name | 32 characters |
| - Program stop / end (M00, M01 / M02, M30) | |
| - Programmable data input | G10 |
| - SUB program call | 10 folds nested |
| - Tape code : ISO / EIA auto recognition | EIA RS422 / ISO840 |
| - Work coordinate system | G52 ~ G59 |

TOOL FUNCTION / TOOL COMPENSATION

| | |
|---|----------------------|
| - Automatic tool offset | |
| - Direct input of offset value measured | |
| - T - code function | T2~2 digits |
| - Tool geometry / wear compensation | |
| - Tool life management | |
| - Tool nose radius compensation | |
| - Tool offset | G43, G44, G49 |
| - Tool offset pairs | ±6 digits : 64 pairs |
| - Tool offset value counter input | |
| - Y-axis offset ² | |

EDITING OPERATION

| | |
|---------------------------------|-----------------|
| - Back ground editing | |
| - Number of registered programs | 500 ea |
| - Part program editing | |
| - Part program storage size | 640m (256 kB) |

SETTING AND DISPLAY

| | |
|--|---------------|
| - Actual cutting feedrate display | |
| - Alarm display | |
| - Alarm history display | |
| - Display of spindle speed and T code at all screens | |
| - Multi-language display | |
| - Program comment display | 31 characters |
| - Run hours / part count display | |
| - Status display | |
| - Operating monitor screen | |

DATA INPUT / OUTPUT

| | |
|-------------------------------|-----------|
| - External work number search | 15 points |
| - Memory card input / output | |
| - RS232C Interface | |
| - Automatic data backup | |

OTHERS

| | |
|----------------|---------------------|
| - Display unit | 10.4" Color TFT LCD |
| - MDI unit | |
| - PMC system | |

INTERFACE FUNCTION

| |
|---------------------------------------|
| - Ethernet function Embedded ethernet |
|---------------------------------------|

OPERATION GUIDANCE FUNCTION

| |
|--|
| EZ Guide (Conversational Programming Solution) |
|--|

OPTIONAL SPECIFICATIONS

AXIS CONTROL

| | |
|-----------------------------------|-----------------------------|
| - Chuck and tail stock barrier | |
| - Stored pitch error compensation | (X1, size bed / standard) |
| - Stored stroke 2 and 3 | |

OPERATION

| | |
|------------------------------|---------|
| - Manual handle feed | 2 units |
| - Manual handle interruption | |
| - Reference position shift | |

INTERPOLATION FUNCTIONS

| | |
|------------------------------------|--|
| - 3rd / 4th reference point return | |
| - Arbitrary speed threading | |
| - Circular threading | |
| - Interruption type custom macro | |
| - Multi step skip | |

FEED FUNCTION

| | |
|--|--------|
| - AI Contour control I (Look-ahead block no. Is Max30) | |
| | G51 Q1 |

PROGRAM INPUT

| | |
|---|----------|
| - Addition of workpiece coordinate system pair | |
| | 48 pairs |
| - Automatic corner override | |
| - Optional block skip (Soft operator's panel) | 9 piece |
| - Pattern data input | |

TOOL FUNCTION / TOOL COMPENSATION

| | |
|---|----------------------|
| - Addition of tool pairs for tool life management | |
| | 128 pairs |
| - Tool Load Monitoring system | |
| - Tool offset pairs | 99 / 400 / 999 pairs |

EDITING OPERATION

| | |
|---------------------------------|----------------------|
| - Number of registered programs | 1000 (512kB) ea |
| - Part program storage length | 1280 / 2560 / 5120 m |
| - Play back | |

DATA INPUT/OUTPUT

| | |
|-------------------------------|-----------------|
| - Fast ethernet / Data server | Only for 1 path |
| - DNC1 control | |
| - Remote buffer | Only for 1 path |

ROBOT INTERFACE

| |
|---------------------------------------|
| Robot Interface with PMC I / O module |
|---------------------------------------|

¹ 1PLMA 400 / 700 / 1000 NLM

² 1PLMA 600 / 700 / 800 LY / LY



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Doosan Machine Tools

Optimal Solutions for the Future

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